# Guidance for Managing Asbestos Disposal Sites

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

*published by*
*the New Hampshire Department of Environmental Services*
*in cooperation with*
*the New Hampshire Department of Health and Human Services*

NEW HAMPSHIRE DEPARTMENT OF HEALTH AND HUMAN SERVICES
COMMUNITIES · FAMILIES
HEALTH · INDEPENDENCE

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# Guidance For Managing Asbestos Disposal Sites

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This guidance document is being made available as one of the many steps in developing a regulatory framework for asbestos waste sites that is protective of public health. Other materials relating to this regulatory effort will be published and distributed as appropriate.

This guidance document may be periodically updated. The most current version of the document can be found on the Internet at www.des.state.nh.us. Additional copies are available from the New Hampshire Department of Environmental Services. See Section V for address and other contact information.

## ~Acknowledgments~

*This document was prepared by the Solid Waste Management Bureau at the New Hampshire Department of Environmental Services (NHDES), in cooperation with the New Hampshire Department of Health & Human Services (NHDHHS). A special "thank you" is extended to Brook S. Dupee and the staff of the Office of Community & Public Health at NHDHHS for their technical assistance, as well as to Judy Small at NHDES for contributing her graphic design services and talents to arranging the layout of this document.*

*Photographs #1-16 in Section II of this document are provided courtesy of the U.S. Environmental Protection Agency. The photographs were taken at various locations in Nashua and Hudson, New Hampshire during the 1980's and were originally published in a pamphlet entitled "A Guide to the Identification of Asbestos Disposed in Soil", which was developed by the New England Regional Office of the U.S. Environmental Protection Agency, Office of Pesticides and Toxic Substances.*

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# PURPOSE

This document provides information needed by property owners to properly manage sites where asbestos manufacturing waste is known or suspected to be buried. Many such properties exist in New Hampshire. The largest concentration of confirmed asbestos disposal sites is situated in the Nashua/Hudson area where, over a period of approximately 70 years, asbestos waste from a local manufacturer was used to fill a number of residential, commercial and industrial properties. Asbestos products manufacturing plants also once operated in Tilton and Meredith, New Hampshire.

Because exposure to asbestos poses a risk to human health, there is a need to properly manage properties where asbestos has been disposed. In response to this need, the New Hampshire Department of Environmental Services (NHDES), in cooperation with the New Hampshire Department of Health and Human Services (NHDHHS), has compiled this guide for owners of asbestos disposal sites and others who live, work and recreate at or near asbestos disposal sites. The guide is organized into five major sections, to provide the following information:

- **SECTION I: GENERAL INFORMATION**
  *provides general background information about asbestos, asbestos health hazards, asbestos manufacturing, and asbestos manufacturing waste disposal practices in New Hampshire*

- **SECTION II: . . . . . SITE IDENTIFICATION**
  *explains how to recognize asbestos manufacturing waste and identify sites where asbestos manufacturing waste may be located*

- **SECTION III: REMEDIAL MEASURES**
  *identifies options, criteria and procedures for permanently minimizing the risk of human exposure to asbestos at sites where asbestos manufacturing waste has been disposed*

- **SECTION IV: BEST MANAGEMENT PRACTICES FOR COVERED ASBESTOS DISPOSAL SITES**
  *provides recommended practices and procedures for properly managing asbestos disposal sites*

- **SECTION V: . . . . . ADDITIONAL INFORMATION**
  *identifies additional information sources, including government contacts, regulations, and related information.*

The primary objective of this guidance document is to educate and inform persons about asbestos disposal sites, so that they may exercise good judgement in protecting themselves and others from potential asbestos exposure. Although this guidance document provides sufficient information to achieve this objective, it does not contain sufficient detail for the reader to become an expert in the matter of handling asbestos-containing materials. Instead, the reader will learn how to recognize and avoid potential hazards relating to the presence of asbestos, with the understanding that professional assistance is needed in situations that require asbestos-containing materials to be handled or disturbed.

# SECTION I: GENERAL INFORMATION

## What is asbestos?

"Asbestos" is the name given to a group of minerals that occur naturally as masses of fibers which can be separated into thin threads and woven, or combined with binding materials and pressed into solid form. There are six primary types of asbestos:

- Chrysotile;
- Amosite;
- Crocidolite;
- Anthophyllite;
- Actinolite; and
- Tremolite.

Asbestos is non-combustible, is resistant to corrosion, has a high tensile strength and has low electrical conductivity. These characteristics, in addition to the material's relatively low cost, made asbestos an attractive material for producing a variety of commercial products over a period of 100 years, beginning around 1880. Such products included:

- Friction devices, for example clutches and brake shoes;
- Plastic products, for example floor tile, coatings and sealants;
- Paper products, for example roofing felt and gaskets;
- Textile products, for example curtains and gloves;
- Building construction materials, for example siding and roofing shingles, "cement board", peg board;
- Road construction materials, for example wearing surfaces and curbing; and
- Insulating products, for example boiler insulation, pre-formed pipe wrapping and troweled/sprayed coatings.

## How was asbestos used by New Hampshire manufacturers?

For nearly a century, New Hampshire was home to a number of asbestos manufacturing facilities. Plants were located in Nashua, Meredith, and Tilton.

The Nashua plant, owned by the Johns-Manville Corporation, commenced operations around 1900. It ceased manufacturing asbestos-containing products in 1985 and the buildings were razed in 1997. The principal raw materials used at the Nashua plant consisted of asbestos fiber and Portland cement. These were combined to produce 4' by 8' sheets of "cement board" material which ranged from 1/8" to 4" in thickness. In addition, the Nashua plant produced a variety of other asbestos-cement products for construction and industrial uses, primarily durable insulation products.

For many years (c. 1900 - 1970) the Nashua plant made its asbestos-containing waste material available free of charge to area property owners for use as fill. Consequently, asbestos-containing waste material was dumped in large quantities throughout the Nashua/Hudson communities, generally to fill low lying areas and facilitate land development. Today, over 300 properties in Nashua and Hudson are identified as asbestos disposal sites. Additional sites are being identified each year.

Less is known about the waste disposal practices of the asbestos manufacturing plants formerly located in Meredith and Tilton. At the site of the Tilton plant, there are two areas which the company used to landfill asbestos waste. These areas are no longer in use and are capped with soil materials. In Meredith, asbestos waste was disposed of at the town landfill. The existence of other dump sites in Tilton and Meredith is not known.

## Why should I be concerned about asbestos?

The U.S. Occupational Safety and Health Administration (OSHA) is aware of no instance in which exposure to a toxic substance has more clearly demonstrated detrimental health effects on humans than has asbestos exposure. For this reason, asbestos manufacturing has largely ceased in this country and a number of government regulatory programs have been established to address the safe management of asbestos within our living environment.

## What health hazards are associated with asbestos?

The inhalation of asbestos fibers in high concentrations is known to cause:

- **Asbestosis**, a debilitating and irreversible respiratory illness which is characterized by a scarring of the lung tissue, or linings of the lung, which thereby reduces lung function and makes breathing more difficult;

- **Mesothelioma**, a cancer of the thin membranes lining the chest and abdomen, which is almost exclusively caused by exposure to asbestos and is almost always fatal; and

- **Lung cancer and other cancers**, including cancers of the larynx, tongue, sinuses, mouth, throat, stomach, colon, rectum, intestines, kidney, pancreas, and gall-bladder.

Symptoms of asbestos-caused diseases generally do not appear for 10-35 years after the first exposure to asbestos.

There is no known level of asbestos exposure which is considered risk free. Moreover, among people exposed to asbestos, cigarette smokers are at much greater risk of developing lung cancer than those individuals who do not smoke.

## What are the exposure pathways of concern?

The inhalation of asbestos is the primary exposure route of concern. Ingestion of asbestos is another concern. Direct contact with asbestos is not of concern from the perspective of absorption through the skin. However, by making direct contact with asbestos, a person's skin or clothing can become contaminated with asbestos fibers and the fibers can then be carried into the home or workplace, where they may become airborne or transferred to the mouth. The same applies when tools, machinery or toys come in contact with asbestos-containing materials.

Asbestos fibers are not water soluble and do not move through groundwater to any appreciable extent. Based on studies of other insoluble particles of similar size, the expected migration rate of an asbestos fiber through soils by the forces of groundwater is approximately 1 to 10 centimeters (0.4 to 4 inches) per 3,000 to 40,000 years. Thus, asbestos is not considered a groundwater contaminant.

Although asbestos does not move with groundwater flow, it can move with surface water flow. Therefore, if asbestos waste is allowed to come in contact with rivers, wetlands and other surface water bodies, fibers may be transported to places that will result in human exposure, including intakes for drinking water supplies and recreation areas.

# SECTION II: SITE IDENTIFICATION

## What does asbestos manufacturing waste look like?

Asbestos cannot be positively identified without microscopic analysis by a qualified laboratory technician. However, the trained naked eye can spot materials on the surface of, or in soil, that have a high probability of being asbestos.

Generally speaking, asbestos manufacturing waste exists in the following forms:

- Pellets;
- Spheres;
- Whole sheets;
- "Plate waste" (sheet scraps/fragments);
- Rolled sheets;
- Dewatered sludge; and
- "Baghouse" (dust collector) waste.

Asbestos manufacturing waste comes in a variety of colors, including gray, white, black, green, and red. After being in the soil for many years, it has a tendency to blend with its surroundings and becomes hard to distinguish from the natural soils. This is most often the case with "baghouse" waste, which is a fine, dust-like material which resembles soil particles.

However, the naked eye, trained by experience, can often detect the presence of asbestos manufacturing waste by also studying the physical characteristics of a site, including the vegetation and terrain. Based on experience, the following site features are considered key "indicators" for locating buried asbestos waste in areas of known dumping:

- Topographic features indicating that the site has been filled;
- Debris, typically in the form of pellets, spheres and/or plate waste, located on or near the surface of the ground, or protruding from steep banks or extending into surface waters and wetlands;
- Scant vegetation and/or vegetation consisting of moss, sumac trees, poison ivy, and/or pricker bushes;
- Hummocks along a forest floor, often in a grid-like or symmetrical pattern; and
- Refuse/solid waste items, such as glass bottles, cans and other household items.

The photographs presented on the following pages depict some of the many types, colors and forms of asbestos manufacturing waste dumped in the Nashua / Hudson area. Photographs #1 - 16 were taken by the U.S. Environmental Protection Agency during the 1980's while undertaking site remedial work in the area. The remaining photographs, taken by NHDES, were taken more recently in the Nashua/Hudson area. By studying these photographs, the reader can begin to understand how to recognize asbestos manufacturing waste.

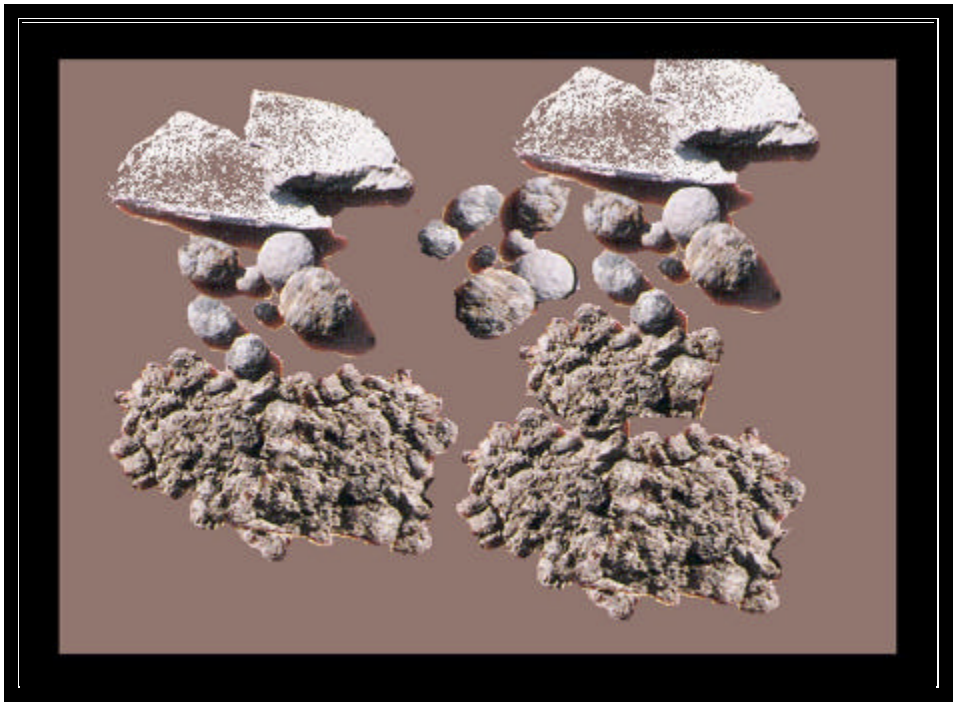


FIGURE 1. Small solid objects having an unnatural appearance such as spheres, pellets or thin gray irregularly shaped material.

FIGURE 2. Buried uniformly shaped solid objects ½ to 1 inch in diameter, resembling stones. May be asbestos and could indicate the presence of larger quantities of the waste material. See Figure #1 for close up.

FIGURE 3. Protrusions of thin (1/4") irregularly shaped material from the soil may indicate that asbestos waste is buried below the surface. Round object in lower right is 2" diameter.


FIGURE 4. Areas of no or poor vegetation growth, with gray or colored areas of soft material which looks different than natural soil, should be suspect.

FIGURE 5. Very dark or black "soil" sometimes associated with moss growth should be analyzed for possible asbestos presence.

FIGURE 6. Piles or pieces of gray or colored sheets, usually 1/4" to ½" thick, either alone or with soft "soil," may possibly be asbestos.

FIGURE 7. Piles of black, gray, or green material that is soft or spongy to the touch, either alone or with pieces of gray sheets should not be dug in or walked on until tested for asbestos.

FIGURE 8. Gray or green deposits that have an unnatural soil appearance, usually void of grass, should be suspect.

FIGURE 9. Areas of woodland having poor growth and a flat surface, containing fragments or pieces of gray or green sheets may indicate an asbestos disposal site.

FIGURE 10. Deposits of thin sheet fragments sticking out of, or lying on the ground. See Figure #13.

FIGURE 11. Small cylindrical shaped pellets, 1/4 inch in diameter.

FIGURE 12. Piles of gray or colored sheets on the ground, or found buried in the ground.

FIGURE 13. Sheet pieces sticking out of black or very dark "soil" with little or no grass growth.

FIGURE 14. Light gray dust on black, damp soil or lighter dry soil. Note presence of green fragments and light balls. All are asbestos.

FIGURE 15. Green and gray, soft or spongy material. Piles of sheet fragments. All are asbestos.

FIGURE 16. Very dark or black “soil” that turns light gray when dry. Fragments in lower right. All are asbestos.

FIGURE 17. Plate scrap mixed with friable baghouse waste, used as fill beneath paved driveway.

FIGURE 18. Plate scrap mixed with friable baghouse waste buried beneath a few inches of soil in a residential yard. Note red, blue, white and gray colors.

FIGURE 19. Red and gray sheet waste and plate waste, mixed with black baghouse waste (near top of photo).

FIGURE 20. Excavation showing friable asbestos waste (red, white & black) and plate scrap.

## Are all forms of asbestos waste considered a health hazard?

Yes. But the degree of risk will vary, depending on the potential for the material to release fibers. Generally speaking, asbestos-containing materials are classified as either "friable" or "non-friable":

- The term "friable" indicates the material can be crushed, pulverized, or reduced to powder, when dry, by hand pressure.

- The term "non-friable" indicates the material can not be crushed or pulverized under hand pressure.

Friable asbestos-containing materials pose a greater risk of exposure than do non-friable asbestos-containing materials. However, even non-friable asbestos-containing materials require careful handling and proper disposal. Non-friable asbestos-containing materials, when left exposed to the elements, will deteriorate and become friable over time. In addition, based on observed dumping patterns in Nashua and Hudson, it appears that the waste was often dumped in mixed loads, including both friable (e.g., baghouse waste, dewatered sludge, etc.) and non-friable (e.g., pellets, plate waste, etc.) asbestos-containing material. Therefore, it is prudent to assume that the presence of non-friable asbestos waste is indicative of the presence of friable asbestos waste, even though the friable material may not be visually apparent.

## What should I do if I locate a site with asbestos manufacturing waste?

Contact the New Hampshire Department of Environmental Services (NHDES) or your local health officer. See Section V for contact information.

See also "Best Management Practices for Covered Asbestos Waste Sites" in Section IV of this document, specifically BMP 4.0 (Imminent Hazard Response) and BMP 5.0 (Unplanned Encounters).

## What should I do if I think I have been exposed to asbestos?

Contact your physician for a baseline physical and professional advice. Also, be advised that smoking, combined with asbestos exposure, substantially increases your risk of developing respiratory illness.

# SECTION III: REMEDIAL MEASURES

## What are "remedial measures"?

The term "remedial measures" is used to describe actions undertaken to remedy environmental contamination problems. In the case of an asbestos disposal site, the term more specifically refers to actions which will provide long-term assurance that humans will not be exposed to asbestos at, or from, the site.

## What remedial measures are typically used at an asbestos disposal site?

There are three basic approaches to remedying environmental contamination at an asbestos disposal site, either:

- Have all of the asbestos waste removed from the site to an authorized, secure landfill; or
- Have the site "capped" by covering the asbestos waste with non-asbestos-containing materials (for example, clean soil and vegetation) which are designed to prevent the waste from becoming re-exposed; or
- Have a combination of the above implemented.

Each of the alternatives requires professional assistance, typically involving specially trained and licensed contractors, industrial hygienists, and civil engineers with earthwork and waste management experience.

## Which remedial alternative (removal vs. capping) is best?

The "best" remedial alternative depends on a number of factors, including:

- The specific characteristics of the site (e.g., type and quantity of waste; location and depth of waste; terrain, drainage, and other geophysical features; and presence of buildings, driveways, underground utilities, and the like); and
- The exposure risks posed by existing and allowable land use activities at the site.

Although waste removal can eliminate the long-term risks associated with a site, removal activities involving a large quantity of asbestos waste can significantly increase short-term risks, particularly in areas where the excavation work is difficult due to terrain conditions, poor access, unanticipated events including windy weather, and other factors. Further, removal can sometimes be the more costly solution in terms of up-front dollars. Following removal, the waste must be disposed at a permitted, secure landfill, thus involving transportation costs and disposal fees. The cost of refilling the excavated area with clean soil must also be considered, in addition to all other typical project costs, including air monitoring, site security, personal protection including respirators and disposable clothing, decontamination provisions for equipment and personnel, and use of specially licensed contractors.

When removal is not feasible, capping the waste in-place can provide a practical and cost-effective long-term solution, provided that the cap is properly designed, the best management practices specified in Section IV of this guide are strictly observed, and additional activity and property use restrictions are instituted as necessary to protect and maintain the cap for perpetuity.

## What are the criteria for designing a cap?

To provide effective performance, a cap must be designed to completely isolate all of the asbestos-containing waste materials, in order to eliminate all pathways for human exposure (inhalation, ingestion, direct contact). The cap must also be designed to not deteriorate or become damaged under all anticipated site conditions. This means the cap must be designed to withstand the forces of nature (wind, water, frost, etc.) and, at sites used for human activity, the forces induced by such activity. For example, if the disposal area is used as a parking lot or driveway, the cap must be designed to support vehicular loads and withstand routine maintenance, including snow removal and the application of de-icing agents.

Federal requirements set forth in the National Emission Standards for Hazardous Air Pollutants or "NESHAP" (ref. 40 CFR 61.151) specify that inactive asbestos disposal sites must be covered by no less than 6 inches of non-asbestos-containing material, with vegetation, (i.e. clean soil and grass). However, if buried asbestos waste is subjected to repeated freeze/thaw cycles, it may eventually resurface. Therefore, to construct a cap that will minimize the potential for frost induced resurfacing, the asbestos should be buried beneath the frost line. Studies have shown that in the Nashua/Hudson area, at least 2 feet of soil cover is needed to protect against resurfacing over a 100-year period. Other types of cover materials, for example geotextiles, asphalt, and concrete, can also be used in some situations to form a barrier against resurfacing.

Soil caps must be compacted and graded to facilitate appropriate drainage patterns and to control erosion. In addition, the surface must be seeded, rip rapped, or otherwise treated to also protect against soil erosion. If the cap intercepts a surface water body and/or is situated in a flood hazard area, for example a cap situated along the edge of a wetland or river, special design considerations must be employed to withstand the anticipated water action and saturated conditions. For example, gabions (wire cages filled with stone) or standard rip rap can be effective choices for treating the surface of caps along water bodies.

Each site is different and, therefore, each cap design will likely be different. However, the underlying performance objective of providing a low maintenance, sustainable solution, must always be achieved in order for the remedial effort to be considered complete.

## What is the process for initiating and undertaking remedial action?

NHDES has established a program to provide technical assistance to owners of asbestos disposal sites. Owners who undertake remedial action should first contact NHDES to coordinate the progression of remedial activities, to assure that the work is consistent with the remedial criteria and regulatory requirements.

There are four basic stages of remedial work:

- First, a site investigation is undertaken to characterize the site.
- Second, remedial options are evaluated and a decision made to either remove the waste, cap it in-place, or use a combination of both.
- Third, a remedial action plan (RAP) is developed, including cap design plans/specifications and provisions for safely carrying out the proposed work.
- Fourth, the RAP is implemented.

For additional detail about initiating and implementing the remedial action process, contact NHDES. See Section V for contact information.

## I expect remedial action to be costly. Why should I consider it?

A fully remediated site is protective of human health. This is an important consideration, whether the site is owner occupied, leased or publicly owned/accessed. In addition, a site which is fully remediated is more likely to realize its maximum resale value and lending potential.

# SECTION IV: BEST MANAGEMENT PRACTICES FOR COVERED ASBESTOS DISPOSAL SITES

The information provided in this section describes recommended practices and procedures for properly managing properties where asbestos waste has been buried. These recommendations are referred to as "best management practices" or "BMPs".

The BMPs contained in this guide largely rely on practical techniques for keeping asbestos manufacturing waste isolated and preventing the release of fibers to the environment. These techniques, while not "fool proof", are intended to provide sensible and workable measures for safely using and maintaining property where asbestos waste exists and is covered. Further, the BMPs are designed to comply with regulatory requirements, including federal standards for managing inactive asbestos disposal sites, as specified in 40 CFR 61.151. For a copy of this federal regulation, see Section V.

The BMPs presented in this guide are indexed by topic, as follows:



From time to time, the following BMPs may be revised to include new information. If you own an asbestos disposal site, you should keep a copy of the BMPs with your property records, for reference and periodic updating. Updated BMPs may be obtained by mail from NHDES (see Section V for address information) or from the NHDES website at www.des.state.nh.us.

# BMP 1.0: Activity & Property Use Restrictions

Land development and land use activities at asbestos disposal sites must be protective of cover materials, in order not to disturb the underlying asbestos waste and create an opportunity for human exposure. Federal regulation (40 CFR 61.151) prohibits the disturbance of any asbestos-containing waste material at the disposal site, unless prior notice is supplied to the United States Environmental Protection Agency (US-EPA) and the work procedures are tightly controlled to prevent asbestos emissions. Therefore, to help assure these requirements are met and to limit the potential for human exposure, the following activity and property use restrictions should be strictly observed at every asbestos disposal site:

- ☑ (1.1) Do not dig into or through cover materials. If digging becomes necessary due to an emergency or other unavoidable circumstance, first contact your local health officer and NHDES (see Section V for contact information) to obtain information necessary to comply with applicable regulations and to protect human health. Under no circumstance should you dig into asbestos waste without first obtaining this additional information.

- ☑ (1.2) Do not undertake land development and/or improvement plans which require underground systems to be constructed within the asbestos disposal area, including septic systems, utility lines, closed drainage systems, footings, foundations, wells, and in-ground swimming pools. Similarly, avoid placing utility poles, fence posts, sign posts and the like within the disposal area.

- ☑ (1.3) Do not plant trees and large shrubs within the disposal area. Understand that the root systems of trees and large shrubs within a disposal area have the potential to cause the asbestos to become exposed, either due to shifting the soil cover or being uprooted during a storm. In addition, if a deep rooted tree already exists within the disposal area and the tree must be removed, leave the stump in place.

- ☑ (1.4) Do not conduct vegetable or flower gardening within the disposal area, unless the garden is constructed as a raised bed garden which can be cultivated without disturbing underlying cover materials and waste.

- ☑ (1.5) Do not place your child's sand box within the disposal area, unless it has a solid bottom and you are certain your child will not dig through cover materials into the underlying asbestos waste.

- ☑ (1.6) If you have a dog that digs, do not tie it out in the area of asbestos fill.

- ☑ (1.7) Do not use the disposal area for any activity for which the cover materials are not designed. For example, do not drive motor vehicles, heavy equipment, ATVs or the like over or through the disposal area, unless the cover materials have been specifically designed to withstand the loading and wearing action, especially under muddy conditions.

- ☑ (1.8) Do not alter site terrain in such a manner as to cause drainage patterns to change and erode cover materials.

- ☑ (1.9) Always seek the advice and assistance of your local health officer, NHDES and other qualified professionals whenever there is any question about activity and property use restrictions, and/or the ability to carry out any activity without causing a release of asbestos fibers.

# BMP 2.0: Site Monitoring

Asbestos disposal sites require frequent monitoring to assure that the cover materials remain in good condition and continue to isolate the asbestos. Site monitoring should be accomplished as follows:

☑ (2.1) Regularly (*) inspect the surface of the ground in and around the disposal area to assess the condition of the cover materials and look for exposed asbestos. In addition, repeat the inspection process after each significant weather event, including high intensity rainfalls, floods and wind storms. Signs of cover deterioration or damage include but are not limited to: erosion, settlement, cracking, stressed or dying vegetation, burrowing activity by rodents (moles, woodchucks, ground squirrels, etc.), and vandalism. Signs of exposed asbestos include any of the materials pictured in Section II of this guide. When looking for exposed asbestos, pay close attention to areas where the cover materials have deteriorated or been disturbed, as described above. Also, pay close attention to the area around the base of tree trunks. Growing root systems have the potential to cause asbestos to resurface.

***(*) Note: the recommended frequency of the regular inspections largely depends on individual site characteristics, including the depth/type of cover materials and type of land use. For example, at a site where there is less than optimum cover materials (i.e., a site which has not been fully remediated, as discussed in Section III) there may be a need to inspect site conditions more frequently than at a site which has been fully remediated. In any event, regular inspections should occur no less than twice a year: once in the spring after snowmelt but before leafy growth begins, and once in the fall after the ground vegetation has begun to die off, but before trees have begun to drop their leaves.***

☑ (2.2) If any of the cover deterioration or disturbance problems noted in BMP 2.1 above are observed, implement cover repairs and address other cover maintenance needs as specified in BMP 3.0 (Site Maintenance).

☑ (2.3) If asbestos waste is found on, or protruding through, the surface of the ground, immediately notify your local health officer and NHDES. See Section V for contact information. Remember: exposed friable asbestos constitutes an imminent health hazard. Therefore, proceed only in accordance with BMP 4.0 (Imminent Hazard Response).

☑ (2.4) Cooperate with NHDES and your local health officer when either party wishes to inspect the site. Periodic inspections by trained personnel are an important part of protecting public and personal health.

☑ (2.5) Keep records of all inspections, for future reference. See also BMP 7.1.

☑ (2.6) Always seek the advice and assistance of your local health officer, NHDES and other qualified professionals whenever there is any question about site monitoring needs, and/or the ability to carry out any activity without causing a release of asbestos fibers.

# BMP 3.0: Site Maintenance

Cover materials at asbestos disposal sites must be maintained to keep them in good condition. The following maintenance measures apply:

- ☑ (3.1) Make timely repairs to cover materials which are showing evidence of deterioration or damage, including but not limited to: erosion, settlement, cracking, stressed or dying vegetation, burrowing activity by rodents (moles, woodchucks, ground squirrels, etc.), and vandalism. However, if the repair of cover materials has the potential to disturb asbestos-containing waste materials or to otherwise cause an asbestos fiber emission, do not undertake the work without first consulting with your local health officer and NHDES to be certain the work is protective of human health and complies with regulatory requirements.
- ☑ (3.2) Water and fertilize cover vegetation to promote and sustain healthy growth. Reseed areas where needed. Use environmentally friendly fertilizers whenever possible.
- ☑ (3.3) Cut dead or dying trees within the disposal area before they are uprooted by storms. Leave the stump in place, so as to not disturb the underlying asbestos-containing waste materials.
- ☑ (3.4) Seal and patch asphalt and concrete surfaces which overlay asbestos waste, to prevent and repair cracks.
- ☑ (3.5) If frequent repairs are necessary at the same location for the same reason, identify the cause and look for a more permanent solution, including redesigning the capping system, upgrading the cover materials, or implementing an alternative land use.
- ☑ (3.6) Be certain the repairs do not violate local, state or federal requirements, including but not limited to: flood control, wetland and shoreland protection regulations. Always obtain all local, state and federal permits or approvals that are required to complete the work.
- ☑ (3.7) Always seek the advice and assistance of your local health officer, NHDES and other qualified professionals whenever there is any question about site maintenance needs, and/or the ability to carry out any activity without causing a release of asbestos fibers.

# BMP 4.0: Imminent Hazard Response

Exposed friable asbestos constitutes an imminent health hazard. Therefore, if asbestos-containing waste material is discovered on or protruding from the ground surface (see Section II for representative pictures), immediate steps must be taken to eliminate the risk, as follows:

- ☑ (4.1) Upon discovery, report the condition to your local health officer and NHDES. See Section V for contact information.
- ☑ (4.2) For as long as the asbestos remains exposed, control access to the site to prevent entry by unauthorized and/or unprotected persons. Note: federal regulation (40 CFR 61.151) specifies that an asbestos disposal site which remains uncovered must be fenced and posted with warning signs, unless a natural barrier adequately deters access.
- ☑ (4.3) Assure that there are no visible emissions from the uncovered site, as required by 40 CFR 61.151. An effective means for doing so is to keep the exposed material moist, by using a fine spray or mist.
- ☑ (4.4) Take care not to walk through, drive through, touch, or otherwise make direct contact with the asbestos-containing material. Keep pets and children away from the area. Be aware that making direct contact with the asbestos may result in contaminating clothes and skin, which in turn may result in asbestos fibers becoming airborne or ingested.
- ☑ (4.5) Based on instructions provided by your local health officer and NHDES, engage the services of a qualified professional to develop a plan for covering or removing the asbestos-containing material. Referral lists are available from NHDES. See Section V for information about contacting NHDES and the local health officer.
- ☑ (4.6) Implement the plan, after consulting with NHDES and the local health officer to assure that the work is protective of human health and complies with regulatory requirements. Note: this type of work must be carried out by a professional who is properly equipped and trained. Lacking proper equipment and training, a person engaging in this type of work is at risk of personal exposure, causing other human exposures, and violating local, state, and/or federal regulation.
- ☑ (4.7) Always seek the advice and assistance of your local health officer, NHDES and other qualified professionals whenever there is any question about imminent hazard response actions, and/or the ability to carry out any activity without causing a release of asbestos fibers.

# BMP 5.0: Unplanned Encounters

New asbestos disposal sites are periodically discovered. Therefore, there is always the potential to encounter asbestos-containing waste materials unexpectedly, for example during excavation activities, after severe storms, or while enjoying a walk in the woods. When this happens, the following applies:

☑ (5.1) If the discovery is made during excavation activities, immediately cease work and implement BMP 4.0 (Imminent Hazard Response). Resume work only in accordance with a work plan that is protective of public and worker health, and which meets regulatory requirements, including 40 CFR 61.151 and standards set forth by the U.S. Occupational Safety and Health Administration. Consult with your local health officer and NHDES regarding the adequacy of the plan.

***Note: this type of work must be carried out by a professional who is properly equipped and trained. Lacking proper equipment and training, a person engaging in this type of work is at risk of exposure and/or causing an exposure, and may be in violation of local, state, or federal regulation.***

☑ (5.2) If the discovery is made during casual activity, for example while walking through the woods, take care not to walk through, drive through, touch, or otherwise make direct contact with the asbestos-containing materials; immediately remove yourself from the area; and immediately report the condition to your local health officer and NHDES so a response can be coordinated in accordance with BMPs 4.2 - 4.6.

☑ (5.3) Keep pets and children away from the area. Be aware that making direct contact with the asbestos may result in contaminating clothes and skin, which in turn may result in asbestos fibers becoming airborne or ingested.

☑ (5.4) Always seek the advice and assistance of your local health officer, NHDES and other qualified professionals whenever there is any question about dealing with an unplanned encounter, and/or the ability to carry out any activity without causing a release of asbestos fibers.

# BMP 6.0: Disclosure & Right-to-Know

Knowledge that asbestos waste exists at a specific location is the best means for protecting against human exposure. By complying with the following disclosure and right-to-know practices, the property owner will protect others from being exposed to asbestos.

- ☑ (6.1) When preparing to sell the property, inform the real estate agent and prospective buyer(s) that asbestos-containing waste material exists on the property. Provide relevant information concerning the location of the waste, the depth and type of cover, regulatory requirements, activity and property use restrictions, and other best management practices.

- ☑ (6.2) When renting the property, inform the tenant(s) that asbestos-containing waste material exists on the property. Provide relevant information concerning the location of the waste, the depth and type of cover materials, regulatory requirements, activity and property use restrictions, and other best management practices. In the lease, stipulate the need to comply with the activity and property use restrictions (see BMP 1.0).

- ☑ (6.3) Prior to contracting for work which will involve excavation or other potential disturbances within or near the disposal area, inform the contractor and provide a copy of the work plan developed in consultation with NHDES to address public health and regulatory concerns. (See BMP 1.0).

- ☑ (6.4) Record notice in the chain of title for the property, as specified by 40 CFR 61.151(e). See Section V for a sample notice.

- ☑ (6.5) Notify NHDES when for the property is transferred to a new owner, so that NHDES can properly direct future correspondence concerning the property.

- ☑ (6.6) Always seek the advice and assistance of your local health officer, NHDES, real estate agent, lawyer and other qualified professionals whenever there is any question about disclosure and right-to-know issues, and/or the ability to carry out any activity without causing a release of asbestos fibers.

# BMP 7.0: Record Keeping

It is important to keep good records, which will allow you to document and reconstruct activities that have taken place at asbestos disposal sites under your ownership or control. The following recommendations apply:

☑ (7.1) Maintain a written record of all site inspections that you make pursuant to BMP 2.0.

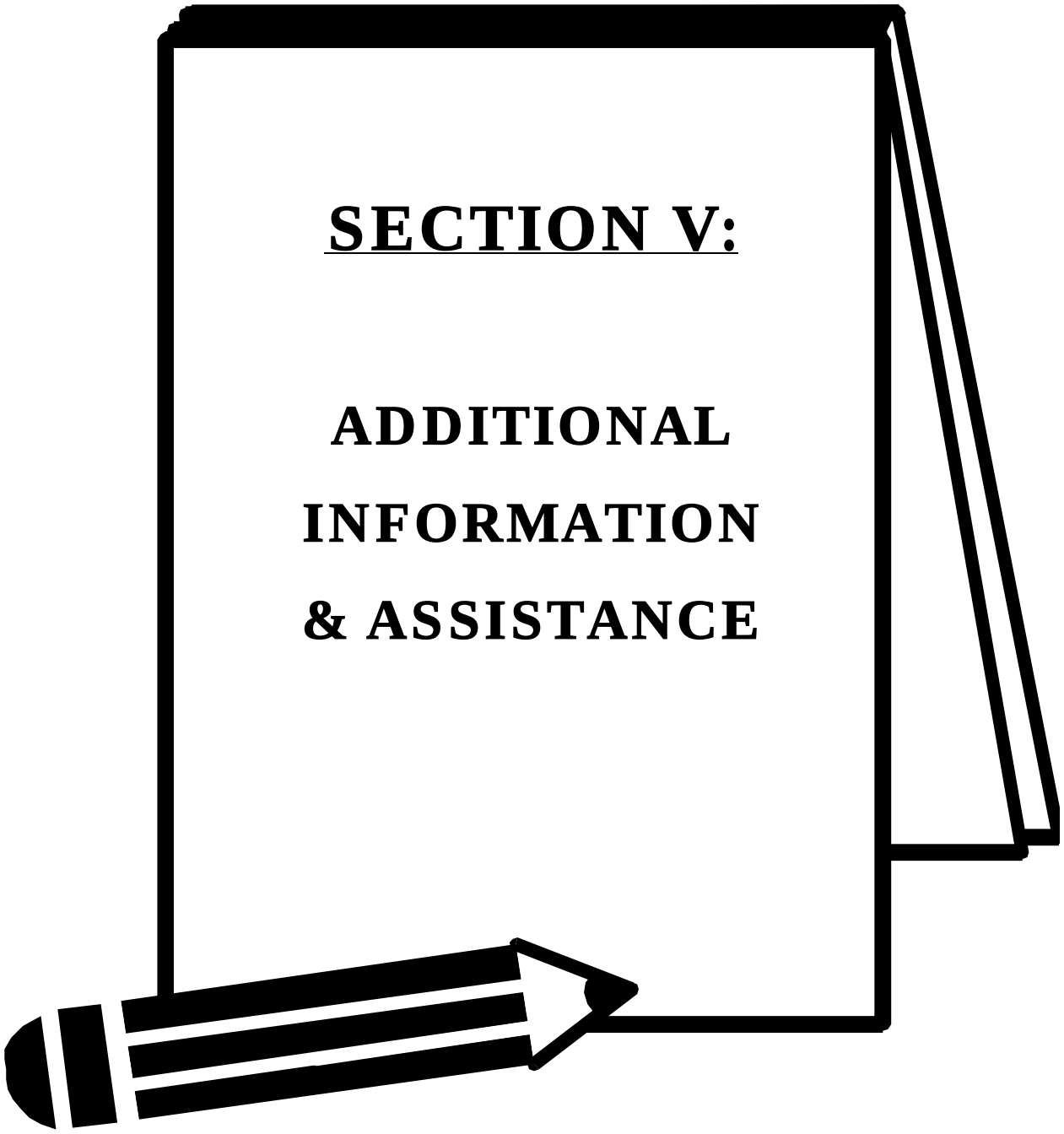
☑ (7.2) Maintain a written record of all repairs and maintenance activities, including the date the work was performed, a description of the work performed and related photographs or diagrams, the identity of all persons performing the work, and other such information as may be needed to fully document the activities.

☑ (7.3) Maintain copies of all official correspondence concerning the site, including correspondence with the local health officer, and state or federal officials. (*)

***(*) Note: NHDES maintains files for asbestos disposal sites. The files include information compiled by NHDES during periodic site inspections. This information typically is sent to the property owner following a site visit. In addition, the files are available for public inspection, by making an appointment with NHDES. See Section V for contact information.***

☑ (7.4) Maintain a scaled map of the site, showing the location of the asbestos disposal area and other information that will allow a third party, such as a contractor, to avoid disturbing the area when working at the site.

☑ (7.5) Always seek the advice and assistance of your local health officer, NHDES and other qualified professionals whenever there is a question about recordkeeping matters, and/or the ability to carry out any activity without causing a release of asbestos fibers.



# SECTION V:

# ADDITIONAL INFORMATION & ASSISTANCE

# DIRECTORY OF GOVERNMENT CONTACTS - Page 1 of 2

| | Government Contact | Asbestos Related Program Responsibilities | Available Information & Assistance re: Asbestos Disposal Sites |
|---|---|---|---|
| State Government | N.H. Dept. of Environmental Services (NHDES)<br>Waste Management Division<br>P.O. Box 95<br>6 Hazen Drive<br>Concord New Hampshire 03302-0095<br><br>PH: (603) 271-2925; FAX: (603) 271-2456<br>www.des.state.nh.us | - Disposal site management, including inspection and remediation<br>- Technical assistance to municipalities and property owners<br>- Liaison to related US-EPA programs | - Additional copies of this document & related updates, if any<br>- List of and records pertaining to asbestos disposal sites<br>- Technical assistance for and oversight of site remediation activities<br>- Copies of rules and regulations |
| | N.H. Dept. of Health & Human Services (NHDHHS)<br>Office of Community and Public Health<br>6 Hazen Drive<br>Concord, New Hampshire 03301<br><br>PH: (603) 271-4609; FAX: (603) 271-2667<br>www.dhhs.state.nh.us | - Health risk assessment<br>- Licensing of asbestos abatement contractors<br>- Certification of asbestos abatement workers<br>- Technical assistance to local health officers<br>- Occupational health & safety programs | - Additional copies of this document & related updates, if any<br>- Licensed Asbestos Abatement Contractor List |
| Federal Government | U.S. Environmental Protection Agency (US-EPA)<br>New England, Region 1<br>1 Congress Street, Suite 1100<br>Boston, Massachusetts 02114-2023<br><br>CUSTOMER CALL CTR.: (617) 918-1111<br>TOLL FREE IN N.E.: (888) 372-7341<br>www.epa.gov | - National Emission Standards for Hazardous Air Pollutants (NESHAP), 40 CFR 61<br>- Site inspection<br>- Site remediation | - Copies of federal environmental regulations and related publications<br>- Technical library<br>- Technical assistance to state government<br>- Remedial assistance to state government |
| | U.S. Department of Labor<br>Occupational Safety & Health Administration<br>279 Pleasant Street, Suite 201<br>Concord, New Hampshire 03301<br><br>PH: (603) 225-1629; FAX: (603) 225-1580<br>www.osha.gov | - Administers/enforces safe work place practices<br>- Job site inspections<br>- Employee training | - Copies of federal labor regulations and related publications<br>- Consultation service for employers to improve their occupational safety and health management systems. Service delivered via state government. |

# DIRECTORY OF GOVERNMENT CONTACTS - Page 2 of 2

| | Government Contact | Asbestos Related Program Responsibilities | Available Information & Assistance re: Asbestos Disposal Sites |
|---|---|---|---|
| Local Government | City of Nashua Health Officer<br>Nashua Dept. of Environmental Health<br>18 Mulberry Street<br>Nashua, New Hampshire 03060<br><br>PH: (603) 594-3356; FAX: (603) 594-3452<br>www.nashuanh.org | - Liaison to NHDES technical assistance and remedial programs | - Tax Maps/ Property Reference Drawings<br>- Limited site files<br>- Local ordinances<br>- Technical assistance concerning local permits and other requirements<br>- Initial response to unplanned encounters and new site discoveries |
| | Town of Hudson Health Officer<br>Hudson Town Offices<br>12 School Street<br>Hudson, New Hampshire 03051<br><br>PH: (603) 886-6005; FAX: (603) 594-1142<br>www.ci.hudson.nh.us | - Liaison to NHDES technical assistance and remedial programs | - Tax Maps/ Property Reference Drawings<br>- Limited site files<br>- Local ordinances<br>- Technical assistance concerning local permits and other requirements<br>- Initial response to unplanned encounters and new site discoveries |
| | Town of Tilton Health Officer<br>Tilton Town Offices<br>257 Main Street<br>Tilton, New Hampshire 03276<br><br>PH: (603) 286-4521; Fax: (603) 286-3519 | - Liaison to NHDES technical assistance and remedial programs | - Tax Maps/ Property Reference Drawings<br>- Limited site files<br>- Local ordinances<br>- Technical assistance concerning local permits and other requirements<br>- Initial response to unplanned encounters and new site discoveries |
| | Town of Meredith Health Officer<br>Meredith Town Offices<br>41 Main Street<br>Meredith, New Hampshire 03253<br><br>PH: (603) 279-4538; FAX: (603) 279-1042 | - Liaison to NHDES technical assistance and remedial programs | - Tax Maps/ Property Reference Drawings<br>- Limited site files<br>- Local ordinances<br>- Technical assistance concerning local permits and other requirements<br>- Initial response to unplanned encounters and new site discoveries |

# TITLE 40--PROTECTION OF ENVIRONMENT
# CHAPTER I--ENVIRONMENTAL PROTECTION AGENCY
# PART 61--NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS
## Subpart M--National Emission Standard for Asbestos

Sec. 61.151 Standard for inactive waste disposal sites for asbestos mills and manufacturing and fabricating operations.

Each owner or operator of any inactive waste disposal site that was operated by sources covered under Sec. 61.142, 61.144, or 61.147 and received deposits of asbestos-containing waste material generated by the sources, shall:

(a) Comply with one of the following:

(1) Either discharge no visible emissions to the outside air from an inactive waste disposal site subject to this paragraph; or

(2) Cover the asbestos-containing waste material with at least 15 centimeters (6 inches) of compacted nonasbestos-containing material, and grow and maintain a cover of vegetation on the area adequate to prevent exposure of the asbestos-containing waste material. In desert areas where vegetation would be difficult to maintain, at least 8 additional centimeters (3 inches) of well-graded, nonasbestos crushed rock may be placed on top of the final cover instead of vegetation and maintained to prevent emissions; or

(3) Cover the asbestos-containing waste material with at least 60 centimeters (2 feet) of compacted nonasbestos-containing material, and maintain it to prevent exposure of the asbestos-containing waste; or

(4) For inactive waste disposal sites for asbestos tailings, a resinous or petroleum-based dust suppression agent that effectively binds dust to control surface air emissions may be used instead of the methods in paragraphs (a) (1), (2), and (3) of this section. Use the agent in the manner and frequency recommended for the particular asbestos tailings by the manufacturer of the dust suppression agent to achieve and maintain dust control. Obtain prior written approval of the Administrator to use other equally effective dust suppression agents. For purposes of this paragraph, any used, spent, or other waste oil is not considered a dust suppression agent.

(b) Unless a natural barrier adequately deters access by the general public, install and maintain warning signs and fencing as follows, or comply with paragraph (a)(2) or (a)(3) of this section.

(1) Display warning signs at all entrances and at intervals of 100m (328 ft) or less along the property line of the site or along the perimeter of the sections of the site where asbestos-containing waste material was deposited. The warning signs must:

(i) Be posted in such a manner and location that a person can easily read the legend; and

(ii) Conform to the requirements for 51 cm x 36 cm (20" x 14") upright format signs specified in 29 CFR 1910.145(d)(4) and this paragraph; and

(iii) Display the following legend in the lower panel with letter sizes and styles of a visibility at least equal to those specified in this paragraph.

| LEGEND | NOTATION |
|---|---|
| Asbestos Waste Disposal Site | 2.5 cm (1 inch) Sans Serif, Gothic or Block |
| Do Not Create Dust..... | 1.9 cm (3/4 inch) Sans Serif, Gothic or Block |
| Breathing Asbestos is Hazardous to Your Health | 14 Point Gothic |

Spacing between any two lines must be at least equal to the height of the upper of the two lines.

(2) Fence the perimeter of the site in a manner adequate to deter access by the general public.

(3) When requesting a determination on whether a natural barrier adequately deters public access, supply information enabling the Administrator to determine whether a fence or a natural barrier adequately deters access by the general public.

(c) The owner or operator may use an alternative control method that has received prior approval of the Administrator rather than comply with the requirements of paragraph (a) or (b) of this section.

(d) Notify the Administrator in writing at least 45 days prior to excavating or otherwise disturbing any asbestos-containing waste material that has been deposited at a waste disposal site under this section, and follow the procedures specified in the notification. If the excavation will begin on a date other than the one contained in the original notice, notice of the new start date must be provided to the Administrator at least 10 working days before excavation begins and in no event shall excavation begin earlier than the date specified in the original notification. Include the following information in the notice:

(1) Scheduled starting and completion dates;

(2) Reason for disturbing the waste;

(3) Procedures to be used to control emissions during the excavation, storage, transport, and ultimate disposal of the excavated asbestos-containing waste material. If deemed necessary, the Administrator may require changes in the emission control procedures to be used; and

(4) Location of any temporary storage site and the final disposal site.

(e) Within 60 days of a site becoming inactive and after the effective date of this subpart, record, in accordance with State law, a notation on the deed to the facility property and on any other instrument that would normally be examined during a title search; this notation will in perpetuity notify any potential purchaser of the property that:

(1) The land has been used for the disposal of asbestos-containing waste material;

(2) The survey plot and record of the location and quantity of asbestos-containing waste disposed of within the disposal site required in Sec. 61.154(f) have been filed with the Administrator; and

(3) The site is subject to 40 CFR part 61, subpart M.

*(40 FR 13661, Apr. 5, 1984, as amended at 53 FR 36972, Sept. 23, 1988. Redesignated and amended at 55 FR 48429, Nov. 20, 1990)*

# SAMPLE/MODEL NOTICE FOR CHAIN OF TITLE RECORDATION

Federal regulation requires the owners of inactive disposal sites to record, at the Registry of Deeds, a notice in the chain of title for the property. The notice shall state: that asbestos-containing waste materials have been disposed on the property; that certain disposal site records, including maps, are filed with the administrator (i.e., the New Hampshire Department of Environmental Services); and that the disposal site is subject to 40 CFR part 61, subpart M, including cover and access control requirements, and limitations regarding excavation or other disturbance of the waste.

Owners who have not yet recorded such notice should do so immediately and provide a copy of the same to the New Hampshire Department of Environmental Services, at the address shown below, and all persons/entities holding interest in the property, including lessees, tenants, mortgagees, and holders of easement rights. A sample notice is provided below. For further instructions concerning the actual recordation process, contact the Registry of Deeds for the county in which the property is located. For properties in Nashua and Hudson, New Hampshire, the Registry of Deeds is located at 19 Temple Street, Nashua, NH, 03060; Telephone: 603-882-6933. For properties in Tilton and Meredith, New Hampshire, the Registry of Deeds is located at 24 Court Street, Laconia, NH 03246; Telephone: 603-524-0618.

# ~*NOTICE*~

Pursuant to the requirements of 40 CFR 61.151(e), notice is hereby provided that asbestos-containing waste materials have been disposed on the property identified below:

## CURRENT PROPERTY OWNER

Name:_____

Mailing Address:_____

## LOCATION OF PROPERTY

Street Address:_____

Town:_____

County:_____ State:_____

Local Tax Map & Lot #:_____ Deed reference, by book & page:_____

Records pertaining to the disposal site, including site maps and a description of cover materials, are on file and available for public inspection at:

**New Hampshire Department of Environmental Services**
**Waste Management Division**
**6 Hazen Drive, P.O. Box 95**
**Concord, New Hampshire 03302-0095**

The disposal site is subject to 40 CFR part 61, subpart M, including cover and access control requirements and limitations regarding the excavation or other disturbance of the waste, as specified in 40 CFR 61.151. For additional information, including information concerning compliance with 40 CFR part 61, subpart M, and best management practices for the disposal area, contact the New Hampshire Department of Environmental Services as cited above.

Witness the execution hereof under seal this _____ day of _____, 19__

Property Owner Signature:_____

Notary Public Signature:_____ My commission expires on:_____